

9451

Dia. Cht. Nos. 1001-3, 1232-2 & 1233-2

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT
(HYDROGRAPHIC)

Type of Survey HYDROGRAPHIC
Field No. PE-40-6-74
Office No. H-9451

LOCALITY

State NORTH CAROLINA
General Locality OCRACOE ISLAND
Locality SWASH INLET TO CAPE HATTERAS

1974

CHIEF OF PARTY

J. K. CALLAHAN

LIBRARY & ARCHIVES

DATE 4-10-75

9451

HYDROGRAPHIC TITLE SHEET

H-9451

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form,
filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

PE-40-6-74

State NORTH CAROLINAGeneral locality OCRACOE ISLANDLocality Cape Hatteras
SWASH INLET TO VICINITY EAST OF HATTERAS INLETScale 1 : 40,000 Date of survey 11 JULY - 17 JULY 1974Instructions dated 13 NOVEMBER 1973 Project No. OPR-437-PE-74Vessel NOAA SHIP PEIRCE, CSS-28Chief of party Lt. Commander John K. CallahanLCDR J.K. Callahan, LCDR D. Wilson, LT. D.L. Suloff, LTJG J.M. Barnhill,
Surveyed by ENS K.M. Holden, ENS B.B. Johnson, ENS D. DrevesSoundings taken by echo sounder, ~~hand lead, pole~~ ⁵⁰⁰⁰ ROSS 200-A SERIAL # 0537-1039-5Graphic record scaled by HYDROPLOT SYSTEM AND SHIP'S PERSONNELGraphic record checked by SHIP'S OFFICERS AND SHIP'S SURVEY PERSONNELProtracted by ~~HYDROPLOT SYSTEM~~ CALCOMP AMC Automated plot by ~~NOAA SHIP PEIRCE~~ AMCSoundings ^{INKED} ~~provided by~~ ~~HYDROPLOT SYSTEM~~ CALCOMP AMCSoundings in UNKNOWN feet at MLW UNKNOWNREMARKS: ALL TIMES ARE GREENWICH MEAN TIME, 000 W.

HDP. H

chk.

1232

1233

1109 See 2 mag. scale

1110 "

1001 "

Applied to stels 7/7/75
CAS.

DESCRIPTIVE REPORT

To Accompany

Hydrographic Survey PE-40-6-74

Registry Number H-9451

OPR-437-PE-74

Coast of North Carolina

1974 Field Season

NOAA Ship PEIRCE, CSS-28

John K. Callahan

LCDR., NOAA

Chief of Party

DESCRIPTIVE REPORT

OPR-437-PE-74

PE-40-6-74

H-9451

A. PROJECT

This survey is an integral part of Project SCOPE, and was conducted in accordance with Project SCOPE instructions and with Project Instructions OPR-437-PE-74 dated 13 November 1973, North Carolina Coast. This project is a continuation of surveys conducted south and east of this area at various times during the past nine (9) years. There have been two (2) changes to the Project Instructions:

CHANGE NO. 1 to PROJECT INSTRUCTIONS OPR-437-PE-74, North Carolina Coast, CHANGE NO. 1 is dated 10 December 1973.

AND

CHANGE NO. 3 to PROJECT INSTRUCTIONS OPR-437-PE-74, North Carolina Coast, CHANGE NO. 3 is dated 8 July 1974.

(NOTE: A CHANGE NO. 2 was never received for PROJECT INSTRUCTIONS OPR-437-PE-74)

B. AREA SURVEYED

This hydrographic survey, PE-40-6-74, is located off the coast of North Carolina. The northern boundary of this survey is from 0.4 NM to 1.0 NM offshore, and extends from Swash Inlet, North Carolina to 1.5 NM west of Cape Point, Cape Hatteras, North Carolina. The area encompassed by this survey is approximately ninety-five (95) square nautical miles.

The area that this survey covers is defined by straight lines connecting the following points:

(READING FROM LEFT TO RIGHT)

From	$34^{\circ} 58.0'N$ $76^{\circ} 09.0'W$	To	$35^{\circ} 01.9'N$ $76^{\circ} 03.7'W$	To	$35^{\circ} 02.3'N$ $75^{\circ} 59.9'W$
To	$35^{\circ} 05.6'N$ $75^{\circ} 57.1'W$	To	$35^{\circ} 08.7'N$ $75^{\circ} 51.3'W$	To	$35^{\circ} 10.1'N$ $75^{\circ} 47.2'W$
To	$35^{\circ} 10.3'N$ $75^{\circ} 44.2'W$	To	$35^{\circ} 11.8'N$ $75^{\circ} 42.2'W$	To	$35^{\circ} 13.7'N$ $75^{\circ} 34.5'W$
To	$35^{\circ} 13.5'N$ $75^{\circ} 33.4'W$	To	$35^{\circ} 08.3'N$ $75^{\circ} 33.4'W$	To	$35^{\circ} 08.9'N$ $75^{\circ} 36.8'W$
To	$35^{\circ} 08.4'N$ $75^{\circ} 43.6'W$	To	$35^{\circ} 05.3'N$ $75^{\circ} 50.3'W$	To	$35^{\circ} 04.7'N$ $75^{\circ} 53.3'W$
To	$35^{\circ} 03.3'N$ $75^{\circ} 54.5'W$	To	$35^{\circ} 02.6'N$ $75^{\circ} 56.8'W$	To	$34^{\circ} 58.0'N$ $76^{\circ} 02.2'W$
To	$34^{\circ} 58.0'N$ $76^{\circ} 09.0'W$				

B. AREA SURVEYED (cont.)

PE-40-6-74 is bounded to the South by it's junction with H-9450, 1:40,000, 1974. The survey is bounded to the Southeast by it's junction with H-9060, 1:80,000, 1969; And is bounded to the Northeast by it's junction with H-9104, 1:80,000, 1970. To the East PE-40-6-74 junctions with H-8808, 1:20,000, 1963.

The prior surveys which PE-40-6-74 overlaps with were not available for comparison.

This survey was conducted from 11 July 1974 to 17 July 1974.

C. SOUNDING VESSEL

All soundings were obtained by the NOAA Ship PEIRCE without the aid of launches or skiffs.

D. SOUNDING EQUIPMENT

A Ross Model 5000, S/N C-537-1039-5, fathometer was utilized in obtaining all soundings. It was constantly maintained using it's built in calibration circuitry and no problems occurred that would affect the accuracy of the soundings. Depths encountered ranged from 23 feet to 67 feet. All soundings were in feet and tenths of feet,

Corrections to echo soundings were calculated and are discussed in the attached Corrections to Echo Soundings Report.

E. SMOOTH SHEET

The smooth sheet for this survey will be computer plotted by the ATLANTIC MARINE CENTER from raw data provided on punch tape by the NOAA Ship PEIRCE.

F. CONTROL

Raydist, Range/Range, was used for horizontal control, operating on a frequency of 3296.400 KHz.

Two portable Raydist shore stations were utilized. Pattern I was HOBUCKEN, located at Latitude $35^{\circ} 14' 40.452''$ N, Longitude $76^{\circ} 33' 20.332''$ W. Pattern II was AVON, located at Latitude $35^{\circ} 20' 47.877''$ N, Longitude $75^{\circ} 30' 09.041''$ W.

Calibration of the Raydist equipment was accomplished by using three point sextant fixes with check angles taken.

For further details, consult the Electronic Control Report which accompanies this report.

G. SHORELINE

There is no shoreline within the limits of this survey.

H. CROSSLINES

Crosslines constituted approximately 4% of all hydrography exclusive of developments. Crossline depths were in excellent agreement with those on regular sounding lines; the agreement being within one (1) foot.

I. JUNCTIONS

This survey junctions with the following surveys:

H-9450	1:40,000	1974
H-9060	1:80,000	1969
H-9104	1:80,000	1970
H-8808	1:20,000	1963

Comparisons with soundings at junctions are fair to excellent. The differences in depths being from 1 to 3 feet, and most generally are from 1 to 2 feet. Exceptions found are listed in the table below.

FINAL DEPTH			
H-9104	PE-40-6-74	LAT.	LONG.
⁶¹ 51 ft.	⁶² 59 ft.	35° 08.5'N	75° 41.9'W
⁶⁶ 55 ft.	⁶⁰ 56 ft.	35° 08.8'N	75° 35.3'W

I. JUNCTIONS (cont.)

FINAL DEPTH			
H-8808	PE-40-6-73	LAT.	LONG.
⁵⁵ 56 ft.	⁵² 51 ft.	35° 08. ⁶⁵ 8 'N	75° 33. ³ 4 'W
52 ft.	⁴⁹ 48 ft.	35° 09.9'N	75° 33.4'W
⁴⁶ 37 ft.	⁴³ 41 ft.	35° 12. ⁶⁵ 4 'N	75° 33. ⁶ 5 'W

J. COMPARISON WITH PRIOR SURVEYS

There were no presurvey items on this survey.

The prior surveys which PE-40-6-74 overlaps with were not available for comparison. However, due to the primitive methods used on past surveys in this area and the somewhat lengthy period of time since the last survey was done in this area, the chart comparisons should give equivalent comparisons as would a comparison with prior surveys.

K. COMPARISON WITH CHARTS

A comparison was made with the largest scale charts of the area,

Chart C&GS 419, 1:40,000, 13th Ed, SEPT 1/73

AND

Chart C&GS 1232, 1:80,000, 20th ED, DEC 29/73

Comparisons of soundings on PE-40-6-74 with Charts 419, and 1232

K. COMPARISONS WITH CHARTS (cont.)

were generally found to be in good agreement with the majority of the differences being within 1 to 2 feet. However, there were a comparatively large number of differences over 3 feet found in the comparison with chart 1232. All exceptions are listed in the table below.

DEPTH		LAT.	LONG.
CHART 419	Smooth Sheet PE-40-6-74		
55 ft.	51 ⁵³ ft.	35° 02.5'N	75° 58.3'W
39 ft.	35 ³⁶ ft.	35° 05.4'N	75° 57.0'W
45 ft.	39 ⁴⁰ ft.	35° 05.6'N	75° 56.3'W
43 ft.	47 ft.	35° 04.7'N	75° 56.6'W

DEPTH		LAT.	LONG.
CHART 1232	Smooth Sheet PE-40-6-74		
60 ft.	56 ft.	35° 05.2'N	75° 53.8'W
54 ft.	46 ⁴⁷ ft.	35° 08.1'N	75° 48.5'W
54 ft.	50 ⁵³ ft.	35° 07.7'N	75° 47.7'W
54 ft.	50 ⁵³ ft.	35° 08.3'N	75° 46.9'W
48 ft.	39 ⁴² ft.	35° 10.6'N	75° 42.0'W

K. COMPARISON WITH CHARTS (cont.)

DEPTH			
CHART 1232	PE-40-6-74	LAT.	LONG.
56 ⁴³ ft.	52 ⁵⁷ ft.	35° 10.2 ³ 'N	75° 41.3 ⁴ 'W
48 ft.	56 ⁵⁷ ft.	35° 03.8 ⁹ 'N	75° 56.0'W
48 ft.	52 ⁵⁰ ft.	35° 04.7'N	75° 55.6 ⁷ 'W
39 ft.	45 ⁴⁴ ft.	35° 07.3'N	75° 52.3'W
54 ft.	60 ⁶⁰ ft.	35° 06.3'N	75° 49.4'W
42 ft.	49 ⁴⁹ ft.	35° 09.0'N	75° 45.3'W
42 ft.	50 ⁵⁰ ft.	35° 09.6'N	75° 45.4'W
48 ft.	55 ⁵⁵ ft.	35° 08.7'N	75° 44.2'W
42 ft.	48 ⁴⁵ ft.	35° 10.2'N	75° 43.4'W
54 ft.	59 ⁴⁹ ft.	35° 10.5'N	75° 39.2'W
54 ft.	59 ⁶⁰ ft.	35° 09.2'N	75° 39.7'W
48 ft.	56 ⁵⁷ ft.	35° 10.0'N	75° 36.1'W

It should be noted that these discrepancies are found around and between Ocracoke Inlet and Hatteras Inlet. These areas are highly changeable because of siltation and various currents made possible by the presence of the inlets. Also the length of time since the chart soundings were taken and the methods used in taking these soundings contributed to the discrepancies. *concur*

L. ADEQUACY OF SURVEY

This survey is adequate to supersede prior surveys for charting. ✓

M. AIDS TO NAVIGATION

There was one (1) aid to navigation in the survey area. It was buoy BW "OC" Mo(A) BELL RA Ref charted at Latitude 35° 01.95'N, Longitude 75° 59.95'W. The detached positions obtained during the survey place this buoy approximately 300 feet North of it's charted position. ✓

N. STATISTICS ✓

Total Number of Positions	1963
Total Hydro Miles	1086.2 NM
Total Crossline Miles	39.8 NM
Total Square Miles	95 Sq. NM
TDC Observations	2
Nansen Casts	2
Bottom Samples	5
Leadline Comparisons	1

O. MISCELLANEOUS

All times were in Greenwich Mean Time. ✓

Bottom samples were logged using consecutive position numbers from the same series of position numbers as would have been used while running a regular hydro line. Each bottom sample was logged as a missed depth, and entered properly on Form 733-M ✓

No bottom samples were taken in the DANGER AREA to the northeast of Ocracoke Inlet, North Carolina, due to the presence of mines supposedly located on the bottom in this area. ✓

Fathogram scanning was accurate throughout the project. The fathogram was scanned by the fatho-operator while on-line, it was then scanned by the ship's survey techs. Any errors were corrected and inserts of other significant soundings were made by the field operations officer and/or the survey techs. Then any final corrections were made and examined during the final check. ✓

Boatsheets and soundings were plotted and logged by the Hydroplot System in conjunction with a Complot Roll Plotter, Model DP-3. ✓

One development was plotted on a 1:10,000 sheet. All other developments were plotted on a 1:40,000 sheet. The 1:10,000 sheet was centered around Latitude 35° 08' 30"N, Longitude 75° 49' 30"W. This development was done on a 1:10,000 sheet in order to allow for extensive development for a more detailed delineation of the bottom. ✓

All rejected data is on the master data tape. Rejected soundings have been changed to missed depths and fix data ignored by using a "3" in the indicator of the short word on the corrector tape. Some rejected fix numbers were used again at a later time and these were logged as duplicate fix numbers. ✓

O. MISCELLANEOUS (cont.)

***It has been requested that a photostated copy of PE-40-6-74 be mailed to Mr. J. L. Dunning, Superintendent of the Cape Hatteras National Seashore. The Address is:

*Done
con*

Mr. J. L. Dunning
United States Department Of the Interior
National Park Service
Cape Hatteras National Seashore
P. O. Box 457
Manteo
North Carolina
27954

P. RECOMMENDATIONS

It is recommended that this survey be considered adequate for charting purposes, and that it supersede prior surveys. ✓

Q. REFERENCE TO REPORTS

Reference can be made to the following reports; ✓

1. Corrections to Echo Soundings Report, PE-40-6-74
2. Electronic Control Report, PE-40-6-74 +

Respectfully submitted for approval by

Jon M. Barnhill
Jon M. Barnhill
LTJG, NOAA

TC/TI TAPE PRINTOUT

130244 0 1004 0001 192 283000 009451
164451 0 0000
000001 0 1001 0001 193 283000 009451
200941 0 1005
201032 0 1001
000001 0 1002 0001 194 283000 009451
103109 0 1006
143442 0 1002
154054 0 1008
163405 0 1002
000001 0 1003 0001 195 283000 009451
000001 0 1004 0001 196 283000 009451
000001 0 1005 0001 197 283000 009451
000001 0 1005 0001 198 283000 009451

CAM3-12
2-22-74

OPR 437

TRA CORRECTION ABSTRACT

VESSEL PEIRCE

SHEET PE-40-6-74

REGISTRY NO. H-9451

Vol.	Jul. Day	GMT From Time	GMT To Time	Velocity Table ft/fms	Draft	Instru- ment Error Corr.	Initial Corr.	S&S Corr.	TRA Corr. ft/fms	Remarks
1	192	130244	164450		10.2			0.4	10.6	+11.0 ft was maintained in the Hydroplot Controller
		164451	2400		10.2			0.8	11.0	
1	193	000001	200940		10.1			0.8	10.9	
		200941	201031		10.1			0.4	10.5	
		201032	2400		10.1			0.8	10.9	
1	194	000001	103108		10.0			0.8	10.8	
		103109	143441		10.0			0.4	10.4	
		143442	154053		10.0			0.8	10.8	
		154054	163503		10.0			0.2	10.2	
		163405	2400		10.0			0.8	10.8	
1	195	000001	2400		9.9			0.8	10.7	
1	196	000001	2400		9.8			0.8	10.6	
1	197	000001	2400		9.7			0.8	10.5	
1	198	000001	052957		9.7			0.8	10.5	

Velocity Table One of One

NOAA Ship PEIRCE CSS-28

PE-40-6-74 OPR-437 H-9451

1974 Field Season

VELOCITY TABLE PRINTOUT

Depth	I n Vel d Corr	Tab No Unit	VES ID	Sheet
000056	0 0002	0001 191	283000	009451
000092	0 0004			
000130	0 0006			
000167	0 0008			
000204	0 0010			
000241	0 0012			
000278	0 0014			
000333	0 0016			
000357	0 0018			
000392	0 0020			
000429	0 0022			
000465	0 0024			
000501	0 0026			
000539	0 0028			
000578	0 0030			
000613	0 0032			
000648	0 0034			
999999	0 0036			

ELECTRONIC CONTROL REPORT
PE 40-6-74 H-9451

A. Horizontal Control

Horizontal positioning for the entire survey, positions 1 thru 1963, was established through the use of electronic Raydist operating in the range/range mode at a frequency of 3296.400 KHz.

B. Shore Stations

The shore station locations were as follows:

Pattern I: Hobucken
Lat. $35^{\circ} 14' 40.452''$
Long. $76^{\circ} 33' 20.332''$

Pattern II: Avon
Lat. $35^{\circ} 20' 47.877''$
Long. $75^{\circ} 30' 09.041''$

Station Hobucken was located two miles east of the Hobucken Coast Guard Station on the west side of Pamlico Sound, North Carolina. The site was located by Photo Party 62. Station Avon was located in the town of Avon approximately ten miles north of Cape Hatteras.

C. Calibrations

All calibrations were computed using three point sextant fixes with check angles to shore signals established by Photo Party 62. Raydist lane counts were computed using AM 560 and the ship's PDP-8 computer.

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2830

SHEET : PE-40-6-74

TIME	DAY	PATTERN 1	PATTERN 2
212201	196	-00049	-00030
225545		-00047	-00032
000018	197	-00047	-00032
000847	197	-00051	-00028
002902		-00045	-00034
015526		-00043	-00036
033714		-00041	-00038
051023		-00039	-00040
063900		-00037	-00042
075117	197	-00035	-00044
084432		-00035	-00044
085028		-00033	-00046
095740		-00031	-00048
102302		-00029	-00050
113032		-00027	-00052
140834	197	-00042	-00038
155648		-00042	-00038
023548	198	+00059	+00068

ELECTRONIC CORRECTOR ABSTRACT

VESSEL : 2830

SHEET : PE-40-6-74

TIME	DAY	PATTERN 1	PATTERN 2
130244	192	-00041	-00028
134901		-00039	-00028
172446		-00037	-00030
200504		-00037	-00030
203716		-00035	-00030
000549	193	-00033	-00032
040546		-00031	-00032
072435		-00029	-00034
110843		-00027	-00034
141452		-00025	-00034
165413		-00025	-00034
174546		-00023	-00035
200941		-00023	-00035
212209		-00027	-00025
222306		-00027	-00025
000016	194	-00027	-00025
003341	194	-00025	-00027
072618		-00023	-00029
103108	194	-00023	-00029
144131		-00022	-00030
192617		-00028	-00025
211958		-00028	-00025
224801		-00030	-00025
000001	195	-00030	-00025
001848	195	-00030	-00025
021301		-00032	-00025
062301		-00034	-00025
101501		-00036	-00025
134101		-00038	-00025
175801		-00040	-00026
211401		-00042	-00026
000006	196	-00042	-00026
001112	196	-00042	-00026
010401		-00044	-00026
045601		-00046	-00026
090001		-00048	-00026
125001		-00050	-00026
163501		-00052	-00026
201731		-00051	-00028

CORRECTIONS
TO
ECHO SOUNDINGS

General

This report covers corrections to echo soundings taken by the NOAA Ship PEIRCE from 11 July 1974 thru 17 July 1974. The corrections apply only to the survey PE-40-6-74, H-9451,

Final corrections are a combination of velocity and TRA corrections which are discussed separately in this report.

The ship operated with one fathometer: A Ross Model 5000 S/N C-537-1039-5. The fathometer was maintained at zero initial by utilizing its built in calibration circuitry. There were no problems encountered that would affect the results of the soundings obtained by the Ross fathometer.

Velocity Corrections

The velocity table is a composite table derived by combining data collected by the NOAA Ship PEIRCE at two (2) oceanographic stations. The Stations were at the following locations on the indicated days:

- | | | |
|----|-----------|----------------|
| 1) | Station 1 | Lat 34 57.5 N |
| | | Long 76 00.7 W |
| | | 2 July 1974 |
| 2) | Station 2 | Lat 34 59.0 N |
| | | Long 75 59.5 W |
| | | 12 July 1974 |

There were two TDC and two Nansen Casts from which the final velocity table was derived.

TRA Corrections

TRA corrections are a combination of the following:

- 1) Draft
- 2) Initial Variation
- 3) Settlement and Squat

where as last, Corra.

Draft

Draft corrections were obtained by measuring the draft of the ship upon entering and leaving port. The difference was then apportioned in 0.1 ft. increments over the entire trip. An abstract of draft is attached to this report.

Initial Variation

The Ross fathometer was maintained at zero initial by utilizing its built in calibration circuitry to calibrate it.

Settlement and Squat

Determination of settlement and squat for the NOAA Ship PEIRCE took place on 1 April 1974 and the following corrections were derived:

Correction	Throttle Setting
0.0 ft	1's
0.05	2's
0.1	3's
0.2	4's
0.3	5's
0.4	6's
0.55	7's
0.8	8's

An abstract of reduced speed is attached to this report.

TRA correctors may be inserted in any one of the following places:

- 1) Hydroplot Controller, appears on master tape
- 2) Corrector Tape
- 3) TC/TI Tape

The total correction would be the algebraic sum of the correctors in the above locations. For this survey the Hydroplot Controller was maintained at +11.0 ft. No correctors appear on the corrector tape. Deviations from +11.0 ft are accounted for on the TC/TI tape.

Attachments to the Velocity Report

- 1) Printout of the TC/TI Tape P.16
- 2) Printout of the Velocity Tape P.18
- 3) Abstract of Draft P.31
- 4) Abstract of Reduced Speed P.30
- 5) Form CAM-3-12 P.17
- 6) Leadline Comparison P.39

ABSTRACT OF DRAFT

<u>Date</u>	<u>Julian Day</u>	<u>Draft</u>
11 July 1974	192	10.2 ft
12 July 1974	193	10.1
13 July 1974	194	10.0
14 July 1974	195	9.9
15 July 1974	196	9.8
16 July 1974	197	9.7
17 July 1974	198	9.7

ABSTRACT OF REDUCED SPEEDS

<u>Date</u>	<u>JD</u>	<u>Speed</u>	Time From (GMT)	Time To (GMT)
11 July 1974	192	6's	130244	164450
		8's	164451	2400
12 July 1974	193	8's	000001	200940
		6's	200941	201031
		8's	201032	2400
13 July 1974	194	8's	000001	103108
		6's	103109	143441
		8's	143442	154053
		4's	154054	163503
		8's	163504	2400
14 July 1974	195	8's	000001	2400
15 July 1974	196	8's	000001	2400
16 July 1974	197	8's	000001	2400
17 July 1974	198	8's	000001	052957

DAILY LANE COUNT ABSTRACT

NOAA Ship PEIRCE

OPR - ~~400~~ 437 PE-40-6-74

Vessel PEIRCE

J.D.	GMT TIME		AVERAGE DIAL CORRECTIONS	
	From	To	P1	P2
192	130244	134900	-.41	-.28
192	134901	172445	-.39	-.28
192	172446	203715	-.37	-.26 - .30
192	203716			
193		000305	-.35	-.30
193	000306	000405 040545	-.33	-.32
193	040546	072434	-.31	-.32
193	072435	110842	-.29	-.34
193	110843	141451	-.27	-.34
193	141452	174545	-.25	-.34
193	174546 202407		-.23	-.35
193	212209		-.27	-.25
194		003000	"	"
194	003001	072500	-.25	-.27
194	072501	143500	-.23	-.29
194	143501	181200	-.22	-.30
194	191000	224800	-.28	-.25
194	224801			
195		021300	-.30	-.25
195	021301	062300	-.32	-.25
195	062301	101500	-.34	-.25

DAILY LANE COUNT ABSTRACT

NOAA Ship PEIRCE
OPR - 437 PE-40-6-74
Vessel

J.D.	GMT TIME		AVERAGE DIAL CORRECTIONS	
	From	To	P1	P2
195	101501	134100	-.36	-.25
195	134101	175800	-.38	-.25
195	175801	211400	-.40	-.26
195	211401			
196		010400	-.42	-.26
196	010401	045600	-.44	-.26
196	045601	090000	-.46	-.26
196	090001	125000	-.48	-.26
196	125001	163500	-.50	-.26
196	163501	182300	-.52	-.26
196	201700	212200	-.51	-.28
196	212200	225300	-.49	-.30
196	225400			
197		002700	-.42	-.32
197	002701	015400	-.45	-.34
197	015401	033600	-.43	-.36
197	033601	050900	-.41	-.38
197	050901	063800	-.39	-.40
197	063801	073300	-.37	-.42
197	073301	085400	-.35	-.44
197	085401	095500	-.33	-.46

DAILY LANE COUNT ABSTRACT

NOAA Ship PEIRCE

OPR - 437 PE-40-6-74

Vessel 437 FESAL

J.D.

GMT TIME

From

To

AVERAGE DIAL CORRECTIONS

P1

P2

197

095501

101900

- 31

- 48

197

101901

104500

-29

- . 50.

197

104501

114500

- 27

-152

197

140000

230141

- . 42

-38

198

023500

053000

+ .59

7.68

22-74

Sheet Checked

OCRACOCKE CALIBRATION SITES

PE-40-6-74

H-9451

144	35 05 3170	075 58 3985	16' ORANGE TRIPOD
145	35 06 0447	075 57 5157	16' ORANGE TRIPOD
146	35 06 3578	075 56 5968	16' ORANGE/GREEN TRIPOD
147	35 06 5917	075 56 1090	16' ORANGE TRIPOD
148	35 07 2489	075 55 2098	16' ORANGE TRIPOD

SIGNALS WERE LOCATED BY PHOTO PARTY 62 USING THIRD
ORDER TRAVERSE.

ELECTRONIC CONTROL PARAMETERS

1. Project # OPR-437 2. Reg. # H-9451 3. Field # PE-40-6-74
4. Type of Control Raydist (Hi-Fix, Raydist, EPI, etc.)
5. Frequency 3296.400 (for conversion of electronic lanes to meters)
6. Mode of Operation (check one):

Range-Range ☒

Range One (R₁)
Station I.D. Hobucken
Range Two (R₂)
Station I.D. Avon

Range-Visual ☐

Lat.	<u>35</u> °	<u>14</u> '	<u>40.452</u> "
Long.	<u>76</u> °	<u>33</u> '	<u>20.332</u> "
Lat.	<u>35</u> °	<u>20</u> '	<u>47.877</u> "
Long.	<u>75</u> °	<u>30</u> '	<u>09.041</u> "

Hyperbolic (3-station) ☐

Slave One
Station I.D. _____
Master
Station I.D. _____
Slave Two
Station I.D. _____

Hyper-Visual ☐

Lat.	_____°	_____'	_____"
Long.	_____°	_____'	_____"
Lat.	_____°	_____'	_____"
Long.	_____°	_____'	_____"
Lat.	_____°	_____'	_____"
Long.	_____°	_____'	_____"

7. Location of Survey:

Range-Range ☒

Imagine an observer is standing at R₁ Station and looking directly at R₂ (check one):

Survey area is to observer's Right ☒ A=0

Survey area is to observer's Left ☐ A=1

Hyperbolic ☐

Looking from survey area toward Master Station:

Slave One must be to observer's Left.

Slave Two must be to observer's Right.

8. ☐ This form is submitted as an aid in preparing a boat sheet.
- ☒ This form applies to all data on this survey.
- ☐ This form applies to part of the data on this survey.

Vessel
EDP # _____

From
Time _____ Day _____

To
Time _____ Day _____

Position Numbers
(inclusive) _____

_____	_____	_____	_____	_____	_____	to	_____
_____	_____	_____	_____	_____	_____	to	_____
_____	_____	_____	_____	_____	_____	to	_____

9. Remarks:

CM3-1-1
3-7-74

OPR 437

POSITION DATA SHEET

PERIOD

SHEET PE 406.74

REGISTRY NO. H-9451

Page 31

Ol.	Jul. Day	First Pos. No.	Time (GMT)	Last Pos. No.	Time (GMT)	Development Positions	Detached Positions	Rejected Positions	Duplicate Positions	Omitted Positions	Bottom Sample
1	192	1	130244	03744	155440	—	13 f	—	—	—	—
1	192	037.1	1554 40	075	1958 03	—	60, 61	62	—	—	—
1	192	076	200504	143	234702	—	—	—	—	—	—
1	192	144	235024	210	034530	—	—	—	—	—	—
1	193	211	034745	271	072434	—	—	—	—	—	—
1	193	272	072651	339	112712	—	—	—	—	—	—
1	193	340	113031	409	152853	—	—	—	—	—	435, 441
1	193	410	153152	457	190134	—	—	—	—	—	448, 453
1	193	458	200941	458	201031	—	—	—	—	—	—
1	193	458 +1	201032	495	232949	—	—	—	—	—	472
1	194	496	233347	560	032254	—	—	—	—	—	—
1	194	561	032449	632	072424	—	—	—	—	—	—
1	194	633	072618	668	093108	—	—	—	—	—	—
1	194	669	103108	682	114018	—	—	—	—	—	—
1	194	683	114108	734	153814	—	—	—	—	—	—
1	194	734+1	153854	763	181147	—	—	—	—	—	—
1	194	764	192617	815	231601	—	—	783	—	—	—

3-11-74
2-7-74

OPR 437

POSITION DATA SHEET

LAURENCE PIERCE

SHEET Pe 40-6A-74

REGISTRY NO. H-9451

	Jul. Day	First Pos. No.	Time (GMT)	Last Pos. No.	Time (GMT)	Develop- ment Positions	Detached Positions	Rejected Positions	Duplicate Positions	Omitted Positions	Bottom Sample
1	195	516	231902	887	033812	-	-	-	-	-	-
1	195	888	034006	955	074210	-	-	-	-	-	-
1	195	956	074446	1018	143411	-	-	-	-	-	-
1	195	1019	114543	1081	152159	-	-	-	-	-	-
1	195	1082	152452	1148	192312	-	-	-	-	-	-
1	195	1149	192542	1221	233850	-	-	-	-	-	-
1	196	1222	234126	1287	032734	-	-	-	-	-	-
1	196	1289	033045	1360	073539	-	-	-	-	-	-
1	196	1361	073500	1429	112922	-	-	-	-	-	-
1	196	1430	113125	1502	153323	-	-	-	-	-	-
1	196	1503	153542	1551	182201	-	-	-	-	-	-
1	196	1552	201731	1609	233808	-	-	-	-	-	-
1	197	1610	234018	1677	033511	-	-	-	-	-	-
1	197	1678	033714	1747	073245	-	-	-	-	-	-
1	197	1748	075117	1792	113632	-	-	-	-	-	-
1	197	1793	140834	1817	154434	-	-	-	-	-	-
1	197	1818	155648	1882	175052	-	-	-	-	-	-

LEADLINE COMPARISON ABSTRACT

SHEET# PE-40-6-74

PROJECT# OPR-437

DAY	TIME	LEAD LINE	FATHO	REMARKS
194		PORT		
		AT RAIL AT WL	DIGITAL ANALOG	
		56.0 43.0	31.4 31.0	
		54.0 43.5	31.4 31.3	
		54.0 43.5	31.2 31.1	
		54.0 44.0	31.5 31.4	
		53.0 43.0	31.1 31.2	
		54.2 43.4	31.3 31.2	AVERAGE
				10.8 RAIL TO
				WATER
		STBD		
		54.0 43.0	29.9 29.9	
		54.0 43.0	30.4 30.4	
		54.0 43.0	30.1 30.1	
		54.0 43.0	30.8 30.9	
		54.0 43.0	30.2 30.4	
		54.0 43.0	30.3 30.3	AVERAGE
				11.0 RAIL TO
				WATER
		54.1 43.2	30.8 30.8	AVERAGE OF
				PORT & STBD
		Inst. Corr. not applied	43.4 + .8	10.0 DRAFT CORR.
			1.6	VEL. CORR.
			42.4	TRUE DEPTH
		10.9	RAIL TO WATERLINE	

APPROVAL SHEET

Field Number PE-40-6-74

Registry Number H-9451

The field work and processing of data from this hydrographic survey was under my immediate daily supervision. The boatsheets and all records have been reviewed and are approved by me. This survey is complete and adequate to supersede all prior surveys of the area.


John K. Callahan, Jr.

LCDR, NOAA

Comdg., NOAA Ship PEIRCE

CAM3-1
1/31/74

ATLANTIC MARINE CENTER

PROJECTION PARAMETERS

POLYCONIC OR MODIFIED TRANSVERSE MERCATOR

1. Project No. OPR-437 4. Requested By Verification Branch (GFT)
2. Reg. No. H-9451 5. Ship or Office AMC
3. Field No. PE-40-6-74 6. Date Required ASAP
7. Polyconic ☒ Modified Transverse Mercator ☐
8. Central Meridian of Projection 75 ° 52 ' 20 "
9. Survey Scale: 1: 40,000
10. Size of Sheet (check one):

36 x 54 ☐ 36 x 60 ☒ Other ☐ Specify _____

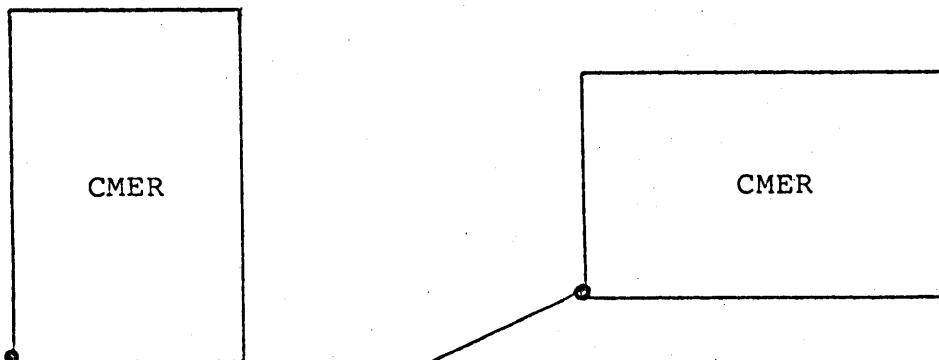
11. Sheet Orientation (check one):

NYX = 1 ☐

NYX = 0 ☒

N

N



12. Plotter Origin: S.W. Corner of Sheet (not necessarily a grid intersection)

Latitude 34 ° 55 ' 45 "

Longitude 75 ° 10 ' 00 "

13. G.P.'s of triangulation and/or signals attached ☐

14. Material Desired: Tracing Paper ☐ Mylar ☒

Smooth Sheet ☒ Other ☐ Specify _____

15. Remarks: _____

Date January 28, 1975

Norfolk, Virginia

VERIFICATION NOTE TO EDP-AMC
Survey H- 9451 Field No. PE-40-6-74
OPR 437

The following overlays and printouts (with additional changes) are requested by the Verification Branch:

 Positions to be changed
 Soundings to be corrected
 Soundings to be excessed

15 Deletions by field

Control Overlay to Position Overlay and Printout
Position to Sounding Overlay and Printout yes
Soundings Corrector Printout Sounding Overlay to Smooth Sheet

Overlay Verified yes Plot Overlay and Printout no
Change Point of Origin yes Change Signals
Change Signal No. Origin yes Enlarge congested area
Plot Sub-plans Cards Punched yes Plot Electronic Arcs
Plot Smooth Sheet yes Mylar ✓ Paper
Plot Soundings in fms tenths to 31 and half fms to 101 no
Plot Sounding Overlay in Color no Black Ink no
Request Corrector Printout yes Change Velocity Correctors no
Change Tide Correctors no TRA Correctors no
Proj. Blue Ball Point Pen and 10 mm Black Ticks yes
Plot Revised Excess Overlay Level 1, 2, 3 1
Plot Soundings at Regular yes 15 30 45
Plot Distortion Points yes Plot Stamp No. 42 yes

Cards have been keypunched for all changes and accompany this note.

After all corrections have been applied, please plot the smooth sheet with plotter origin size .

We are passing over the sounding's overlay;
please plot smooth sheet, Excess Level William L. Jonns
#1 and control position overlay. Chief, Verification Branch
AMC

Distortion point: 34° 57' 00", 76° 09' 00".

STAMP origin: 34° 58', 75° 36'.

Do not plot at all electronic control on this survey.

No. 42 HYDROGRAPHIC SURVEY	
Field No. <u>PE-40-6-74</u>	Reg. No. <u>H-9451</u>
Scale 1: <u>40,000</u>	Plotted: <u> </u> Verified <u> </u>
Projection <u> </u>	EDP-AMC <u>WHG</u>
Ttl. Sta. <u> </u>	None <u> </u>
Topo. Sta. <u> </u>	EDP-AMC <u>WHG</u>
Hydro. Sta. <u> </u>	None <u> </u>
Datum <u>N.A. 1927</u>	
Ref. Sta. <u>Avon (Raydist station)</u>	
Lat. <u>35° 20' 14.75.5</u>	m. Adj. <u> </u>
Long <u>75° 30' 228.3</u>	m. Unadj. <u> </u>
<u>34° 58'</u>	
<u>75° 36'</u>	

VERIFICATION NOTES

Survey H-9451

General

There were no unusual problems with this survey and it appears to be an adequate basic survey. Soundings are in good agreement at crossings and the depth curves adequately delineate the bottom features of the area.

Norfolk, Virginia
March 24, 1975



William L. Jonns
Chief, Verification Branch
AMC.

ATLANTIC MARINE CENTER
APPROVAL SHEET
FOR
AUTOMATED SURVEY H-9451

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~been~~ been made. A new final sounding printout has/~~been~~ been made.

Date: March 24, 1975

Signed: William L. Jonns
William L. Jonns
Title: Chief, Verification Branch

- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic and AMC Manuals. Exceptions are listed in the verifier's report.

Date: March 24, 1975

Signed: C Dale North
C. Dale North, Jr., LCDR, NOAA
Title: Chief, Processing Division

ATLANTIC MARINE CENTER
VERIFICATION OF SMOOTH TIDES

SURVEY H- 9451

PLANE OF REFERENCE MLW OR MLLW
TIME MERIDIAN 0 GMT
HEIGHT DATUM ON STAFFS 1. 4.0 2. 3.

TIDE STATIONS	POSITION	TYPE GAGE	TIME CORR.		HEIGHT CORR. *	
			H.W.	L.W.	H.W.	L.W.
1. Cape Hatteras	ϕ 35° 12' Stand. 35° 13.4'					
Fishing Pier,	Y 75° 42' 75° 38.1'					
N.C.						

2. ϕ
Y

3. ϕ
Y

HOURLY HRIGHTS ☒ FROM ROCKVILLE OFFICE
☐ FROM FIELD MARIGRAMS

VERIFIED BY: Rockville

TIDE ZONING ☒ NOT APPLICABLE
☐ BY COMPUTER
☐ FROM TWO OR MORE GAGES

LIMITS AND DESCRIPTION OF ZONING METHODS

TIDE CORRECTIONS COMPILED ☒ BY COMPUTER
☐ MANUALLY

VERIFIED BY: GFT
VERIFIED BY:

HEIGHT OF MHW ABOVE PLANE OF REFERENCE 3.0

TIDE CORRECTIONS VERIFIED ON SOUNDING PRINTOUT BY: GFT

DATE OF VERIFICATION 12/31/74

*OR RATIO

W. S. Jones
EXAMINED & APPROVED

Tide Note, Project SCOPE, OPR-437, PE-40-6-74, H-9451

Predicted tides for this survey were computed by the ship with the onboard PDB-8 computer using the standard gauge at Hampton Roads, Virginia, corrected to Hatteras Ocean, North Carolina.

The tide gauges operating in the area are as follows:

1. Cape Lookout, North Carolina
Lat 34 37 N, Long 76 32 W
2. Ocracoke, Ocracoke Inlet, North Carolina
Lat 35 07 N, Long 75 59 W
3. Hatteras, (Ocean), North Carolina
Lat 35 12 N, Long 75 42 W

The gauges were installed and maintained by the Tides Section, Atlantic Marine Center.

Zoning between gauges will be done by Atlantic Marine Center Processing Division, CAM22 in accordance with automatic computer zoning techniques.

11/22/74

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for Form 362

Tide Station Used (NOAA Form 77-12): Cape Hatteras Fishing Pier

Period: July 11-17, 1974

HYDROGRAPHIC SHEET: H9451

OPR: 437

Locality: Outer Coast, North Carolina

Plane of reference (mean ~~lower~~ low water): 4.0 ft.

Height of Mean High Water above Plane of Reference is 3.0 ft.

Remarks: Zone direct on Hatteras.

James R. Hulford
for Chief, Tides Branch

GEOGRAPHIC NAMES

9451

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP ATLAS	G RANDOMLY	H U.S. LIGHT LIST	K
ATLANTIC OCEAN									1
CAPE HATTERAS									2
HATTERAS INLET									3
OCCRACKE INLET									4
OCCRACKE ISLAND									5
SWASH INLET									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

Approved
Chas. E. Harrington
Staff Geographer
23 July 1975

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. H-9451

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS	1
DESCRIPTIVE REPORT	1	OVERLAYS	3

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	1	1	1			
CAHIERS						
VOLUMES	1					
BOXES						

T-SHEET PRINTS (List)

SPECIAL REPORTS (List)

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				1963
POSITIONS CHECKED		1960		
POSITIONS REVISED		15		
DEPTH SOUNDINGS REVISED		30		
DEPTH SOUNDINGS ERRONEOUSLY SPACED		0		
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED		0		
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS		0	0	
JUNCTIONS		4	12	
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS		8	12	
SPECIAL ADJUSTMENTS		0	0	
ALL OTHER WORK		29	40	
TOTALS		41	64	
PRE-VERIFICATION BY W. H. Guy		BEGINNING DATE 8/14/74	ENDING DATE 8/16/74	
VERIFICATION BY R. G. Cram		BEGINNING DATE 1/23/75	ENDING DATE 1/28/75	
REVIEW BY <i>Mark G. Fries</i>		BEGINNING DATE 8/6/75	ENDING DATE 8/28/75	

Reg. No. _____

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE _____ TIME REQ'D _____ INITIALS _____

REMARKS:

Reg. No. _____

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE 6-16-82 TIME REQ'D. _____ INITIALS JAC

REMARKS:

H-9451

Items for Future Presurvey Review

There are no noteworthy items for a future presurvey review in the area of the present survey.

<u>Position</u>	<u>Index</u>	<u>Bottom Change</u>	<u>Use</u>	<u>Resurvey</u>
<u>Lat.</u>	<u>Long.</u>	<u>Index</u>	<u>Index</u>	<u>Cycle</u>
350	0754	4	0	50 years
351	0754	4	0	50 years
350	0755	4	2	50 years
351	0755	4	2	50 years
350	0760	4	2	50 years
345	0761	4	2	50 years
350	0761	4	2	50 years

OFFICE OF MARINE SURVEYS AND MAPS
MARINE CHART DIVISION
MODIFIED HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-9451

FIELD NO. PE-40-6-74

North Carolina, Ocracoke Island, Swash Inlet to Cape Hatteras

SURVEYED: July 11-17, 1974

SCALE: 1:40,000

PROJECT NO.: OPR-437

SOUNDINGS: Ross 5000 Depth Recorder CONTROL: Raydist (Range-Range Mode)

Chief of Party	J. K. Callahan
Surveyed by	J. M. Barnhill
.....	D. Dreeves
.....	K. M. Holden
.....	B. B. Johnson
.....	D. L. Suloff
.....	D. Wilson
Automated Plot by	Calcomp 618 (AMC)
Verified and Inked by	R. G. Cram
Reviewed by	M. J. Friese
.....	Date: August 28, 1975
Inspected by	G. K. Myers

1. Control and Shoreline

The origin of control is adequately stated in Part F of the Descriptive Report. No shoreline falls within the area of this survey.

2. Hydrography

A. Depths at crossings are in good agreement.

B. The standard depth curves are adequately delineated. The 36-foot depth curve was added to more adequately delineate the bottom configuration. The development of the bottom configuration and the investigation of least depths are considered adequate.

3. Condition of the Survey

The field work, sounding records, smooth plotting, and the Descriptive Report are adequate and conform to the Hydrographic Manual supplemented by the Instruction Manual - Hydrographic Surveys. However, a +0.8-foot instrument correction was not applied to the TRA corrector.

4. Junctions

Adequate junctions were effected with H-9450 (1974) on the southwest, H-9060 (1969) on the south and H-8808 (1964) on the east.

A butt junction was effected with H-9104 (1970) on the south-east as sounding differences of as much as 3 feet were found in the overlapping area. These differences can be attributed to bottom changes that occurred during the time between the two surveys. The present survey supersedes H-~~9014~~ ⁹¹⁰⁴ in the common area.

No contemporary surveys junction with the present survey on the north and west. However, present depths are in general harmony with charted depths in the area.

5. Comparison with Prior Surveys

A.	H-321	(1852)	1:10,000	H-3922	(1916)	1:20,000
	H-1364	(1877)	1:20,000	H-3902	(1916)	1:20,000
	H-2798	(1905)	1:20,000	H-6834	(1943)	1:10,000
	H-3000	(1909)	1:20,000			

These prior surveys, taken together, show only a few sounding lines in the area of the present survey and provide insufficient information for comparison.

B.	H-244	(1850)	1:20,000	H-1135	(1872)	1:20,000
	H-538	(1856)	1:20,000	H-1457	(1880)	1:40,000

These prior surveys, taken together, cover the entire area of the present survey. In general, a comparison between prior and present depths reveals variable differences of 1-3 feet, which can be attributed to the shifting of sand due to current action within the area of the present survey. With the addition of several bottom characteristics brought forward from H-244 (1850), H-538 (1856), and H-1135 (1872), the present survey is adequate to supersede the prior surveys in the common area.

6. Comparison with Charts 419 (latest print date July 20, 1974) 1232 (latest print date August 31, 1974)

A. Hydrography

The charted hydrography originates with the previously discussed prior surveys, which require no further consideration. The present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

The charted aid to navigation adequately serves the purpose and marks the feature intended within the common area of the present survey.

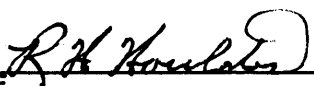
7. Compliance with Project Instructions

The present survey adequately complies with the Project Instructions.

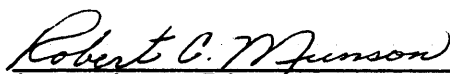
8. Additional Field Work

This is an excellent basic survey and no additional field work is recommended.

Examined and Approved:



Chief
Marine Chart Division



Associate Director
Office of Marine Surveys
and Maps

76°30'

PROGRESS SKETCH

OPR-437

NORTH CAROLINA COAST

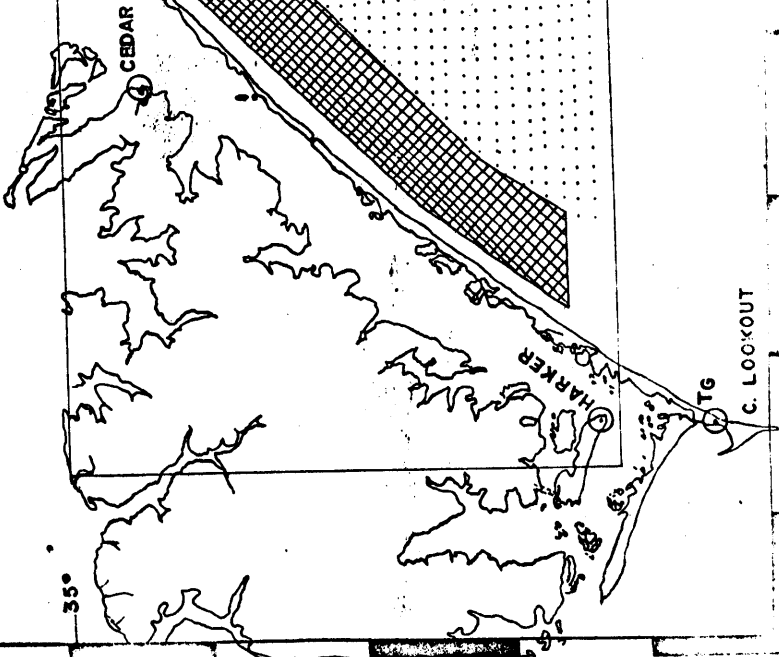
NOAA SHIP PEIRCE

CDR. RALPH J. LAND, COMDG.

1974 FIELD SEASON

SCALE OF CHART 1110

75°30'



PE-40-6-74

LEGEND

from
19th
JUNE

716
160
237
70
15
1
1
4
716

L.N.M. SOUNDING LINE
L.N.M. MISC. DISTANCE TO G FROM
L.N.M. DISTANCE TO G FROM
SQ.N.M. SOUNDINGS
BOTTOM SAMPLES
TDC CAST
NANSEN CAST
SALINITY SAMPLES
L.N.M. SNDG. LINE, PE-40-5-74

PE-40-5-74

JUNE

PRIOR SURVEYS

76°

C. LOOKOUT

